

Abstract

THESIS: Aortic Stiffness and Cardiopulmonary Exercise Test Variables

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Aortic stiffness and cardiorespiratory fitness (CRF) are independent predictors of cardiovascular disease (CVD), cardiovascular events, and early mortality, and are known to be related. However, the relationships between aortic stiffness and other cardiopulmonary variables gathered during a maximal exercise test are largely unknown (CPET). **PURPOSE:** To examine the relationships between aortic stiffness and CPET variables in apparently healthy adults. **METHODS:** Two hundred sixty-five subjects performed a maximal cardiopulmonary exercise test to determine VO_{2max} , Ventilatory Threshold (VT), Oxygen Uptake Efficiency Slope (OUES), Exercise Circulatory Power (CP), Exercise Ventilatory Power (VP), VE/VCO_2 slope, and Oxygen Pulse (O_2 Pulse). Aortic stiffness was measured via carotid-femoral pulse wave velocity (cfPWV). Data were checked for normality, and pearson-product moment correlations were performed to determine the associations between aortic stiffness and each CPET variable. Partial correlations were run to adjust for age and gender. For group analysis, ANCOVAs were used to determine differences in CPET variables between $PWV < 7.6$ m/s and $PWV \geq 7.6$ m/s groups. **RESULTS:** cfPWV was associated ($p < 0.05$) with VO_{2max} , VE/VCO_2 slope, VT, OUES, O_2 Pulse, CP, and VP. When adjusted for age and gender, VO_{2max} (ml/kg/min), VT, CP, and VP remained significant. Between stiffness groups, all variables--except VE/VCO_2 slope--were different ($p < 0.05$), but only VO_{2max} (ml/kg/min) and VP remained significant after correcting for age and gender. Upon correcting for resting systolic blood pressure, no significance remained. **CONCLUSION:** This study provides novel information regarding CPET variables and aortic stiffness in an apparently healthy

cohort. Using CPET in combination with traditional risk factors may help clinicians detect subclinical disease and provide appropriate treatment.

Key words: subclinical disease,